

What is claimed is:

1. An optical waveguide fiber comprising:
 - a core; and
 - a cladding surrounding the core,
 - wherein the cladding contains at least 190 ppm water within at least 20% of its outer periphery in a radial direction.
2. The optical waveguide fiber according to Claim 1 wherein the cladding contains substantially no chlorine.
3. The optical waveguide fiber according to Claim 1 wherein the cladding contains no chlorine.
4. An optical fiber coupler comprising at least one fiber according to Claim 1.
5. An optical waveguide fiber comprising:
 - a core, and
 - a cladding surrounding the core,
 - wherein the cladding comprises an inner cladding and an overcladding, and
 - wherein at least a portion of the overcladding contains at least 300 ppm water.
6. The optical waveguide fiber according to Claim 2 wherein at least a portion of the overcladding contains at least 350 ppm water.
7. An optical fiber coupler comprising at least one fiber according to Claim 5.
8. An optical waveguide fiber comprising:
 - a core; and

a cladding surrounding the core, wherein at least a portion of the cladding contains at least 300 ppm water.

9. An optical fiber coupler comprising at least one fiber according to Claim 8.
10. A first optical waveguide body of fused silica material for fusing to at least one other optical waveguide body of fused silica material, the first body comprising a contact surface, wherein at least a portion of the contact surface is capable of being fused to the at least one other body, wherein the first body contains at least 150 ppm water at or near the contact surface, and wherein at least a portion of the first optical waveguide body contains at least 300 ppm water.
11. The first optical waveguide body according to Claim 10 wherein the first optical waveguide body contains at least 190 ppm water at or near the contact surface.
12. The first optical waveguide body according to Claim 10 wherein at least a portion of the first optical waveguide body contains at least 350 ppm water.
13. The first optical waveguide body according to Claim 10 wherein the contact surface is substantially planar.
14. The first optical waveguide body according to Claim 10 wherein the contact surface is curved.
15. An optical fiber coupler comprising the first optical waveguide body according to Claim 10.
16. An optical fiber coupler comprising:

a plurality of optical waveguide fibers, each fiber having at least a portion fused to the other fibers, wherein at least one of the fibers comprises an overclad region surrounding the core, wherein at least a portion of the overclad region is doped with H_2O and/or D_2O .

17. The optical fiber coupler according to Claim 16 wherein at least a portion of the overclad region contains at least one other dopant selected from the group consisting of GeO_2 , B_2O_3 , and F.

18. An optical fiber coupler comprising:

a plurality of optical waveguide fibers, each fiber having at least a portion fused to the other fibers, wherein at least one of the fibers comprises an overclad region surrounding the core, wherein at least a portion of the overclad region contains at least two dopants.

19. The optical fiber coupler according to Claim 18 wherein the dopants are selected from the group consisting of H_2O , D_2O , GeO_2 , B_2O_3 , F and Cl.

20. A method of forming an optical waveguide fiber preform comprising the steps of:

providing a core cane;

depositing a sooty overclad layer on the core cane to form a sooty overclad preform;

doping the sooty overclad layer to form a doped sooty overclad preform;

and

sintering the doped sooty overclad preform to form a glassy optical waveguide fiber preform;

wherein the doping step comprises selectively adding water to the sooty overclad layer.

21. The method according to Claim 20 wherein the sooty overclad layer is not dried.

22. The method according to Claim 20 wherein the sooty overclad layer is not dried with chlorine.

23. The method according to Claim 20 wherein the doping step further comprises exposing the sooty overclad layer to H_2O and/or D_2O .

24. The method according to Claim 20 wherein the doping step comprises exposing the sooty overclad layer to higher than ambient humidity.

25. The method according to Claim 20 wherein the doping occurs in an elevated temperature chamber.

26. The method according to Claim 20 wherein the doping step further comprises exposing the sooty overclad layer to at least one dopant selected from the group consisting of GeO_2 and B_2O_3 .

27. The method according to Claim 20 wherein the doping step further comprises exposing the sooty overclad layer to at least two dopants selected from the group consisting of GeO_2 , B_2O_3 , and F.

28. A method of forming an optical waveguide fiber preform comprising the steps of:

providing a core cane;

depositing a sooty overclad layer on the core cane to form a sooty overclad preform;

doping the sooty overclad layer with at least two dopants to form a doped sooty overclad preform; and

sintering the doped sooty overclad preform to form a glassy optical waveguide fiber preform.

29. The method according to Claim 28 wherein the doping step comprises selectively adding water to the sooty overclad layer.

30. The method according to Claim 29 wherein the doping step further comprises exposing the sooty overclad layer to H_2O and/or D_2O .

31. The method according to Claim 28 wherein the sooty overclad layer is doped with dopants selected from the group consisting of GeO_2 , B_2O_3 , F and Cl.

32. A method of forming an optical fiber comprising drawing the preform of Claim 20 or 30 into the optical fiber.

33. A method of forming an optical waveguide fiber comprising the steps of:
 providing a silica soot tube;
 doping the silica soot tube;
 sintering the silica soot tube into a doped fused silica tube;
 depositing soot material inside the doped fused silica tube to form a doped-overclad soot preform; and
 sintering and drawing the doped-overclad soot preform into the optical waveguide fiber.

34. The method according to Claim 33 wherein the step of sintering and drawing further comprises sintering the doped-overclad soot preform to form a glassy optical waveguide fiber preform, then drawing the glassy optical waveguide fiber preform into the optical waveguide fiber.

35. The method according to Claim 33 wherein the doping step comprises selectively adding water to the silica soot tube.

36. The method according to Claim 35 wherein H₂O and/or D₂O is selectively added to the silica soot tube.

37. An optical fiber coupler comprising at least one optical fiber having a core and a cladding surrounding the core, wherein the cladding contains at least 50 ppm water at or near the outer periphery of the cladding.

38. The optical fiber coupler according to Claim 37 wherein the cladding contains at least 100 ppm water at or near the outer periphery of the cladding.

39. The optical fiber coupler according to Claim 37 wherein the optical fiber contains at least 190 ppm water within at least 20% of the outer periphery of the optical fiber in a radial direction.

40. An optical fiber coupler comprising at least one optical fiber having a core and a cladding surrounding the core, wherein at least a portion of the cladding contains more than 250 ppm water.

41. The optical fiber coupler according to Claim 40 wherein at least a portion of the cladding contains at least 300 ppm water.

42. The optical fiber coupler according to Claim 40 wherein at least a portion of the cladding contains at least 350 ppm water.